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The new Locality for Subularia aquatica, L.

By David F. Day.

This plant, described by Linnæus from Scandinavian specimens, is probably to be found in all the northern portions of Europe, including Great Britain and Ireland. Whether or not it has been observed in northern Asia, I have, at present, no means of determining; but as plants of such high latitudes are apt to be widely distributed, it probably may be found in Siberia and Kamtchatka. As yet, however, it seems not to have been noticed in Alaska.

Its first discovery in America was by Nuttall. Specimens with his label, accrediting it to "lakes in Maine," are in several herbaria. This was probably between 1830 and 1840.

In 1844 Professor Tuckerman discovered the plant at "Echo Lake, Franconia, N. H." Some time later William Oakes also found it there; and later still, after the failure of many botanists to collect it, in September, 1882, it was rediscovered, in the same locality, by Annie Trumbull Slosson. Her interesting account of it may be read in the 11th vol. of the BULLETIN, at page 118.

A third American locality was found on the 13th September, 1882, by Professor Fletcher, at Vermilion Bay, Eagle Lake, C. P. R., Dawson's Route. See Macoun's Catalogue of Canadian Plants, Vol. I, p. 55.

Since then it has been collected by Bolander, "in pools in Mono Pass on the upper Tuolumne River," in California, by Dr. Parry "at the head of Yellowstone Lake," by Professor Jones in Wyoming Territory, and by C. G. Pringle in Summit Lake, California, by Professor Jos. Schrenk at Squam Lake, New Hampshire, and by Professor Macoun at Sproat Lake, Vancouver.

To these localities Muskoka Lake, Ontario, must now be added, as the tenth American station, where it was found on the first of the current month. The precise spot was along a sandy beach on the northeast side of Slater's Bay, near Port Sandfield.

Probably in all the places, where it has been detected, it grows abundantly; but the localities are so widely scattered and so far out of the lines of ordinary travel, that the species must still be regarded as one of the rare plants of the western continent. There would seem, however, no obvious reason why it may not be found in the waters of northerly Vermont, New York, Michigan or Minnesota. In fact, its detection in Chautauqua Lake should not be regarded as very singular. It may be reasonably looked for wherever such plants as *Eriocaulon septangulare* and *Lobelia Dortmanna* are present.

Since the Muskoka discovery, I have received from my friend, Mr. Meehan, of Germantown, Pennsylvania, a note, mentioning the fact that, in the herbarium of the Academy of Natural Sciences at Philadelphia there are thirteen specimens of *Subularia aquatica*, and with them a label, (intended for one of them), which reads, " The Delaware River, Elias Durand." Below, in the handwriting of Mr. Redfield, are the words, " For all this positive statement of Durand, I doubt whether he got it there. No one else has found it there." One of the thirteen specimens Mr. Meehan regards as very different from the rest. He writes :—" The stem is flexuous where the pedicels connect and the pedicels themselves coarser in every way. This difference does not seem to have attracted Mr. Redfield's notice, and it looks, for all the world, like one who grew away from its home centre—possibly the Delaware." A pen-and-ink sketch accompanies the statement and shows the plant to be very peculiar in its habit.

Prior to the receipt of Mr. Meehan's letter, I had noticed the fact that, for so small a plant, the Muskoka specimens presented among themselves, one remarkable variation. Few of the specimens were more than one-flowered. I think no one had more than three. The scapes of the one-flowered specimens were surely much thicker and heavier than of those which were two- or three-flowered. In this respect they also differed greatly from the Oakes specimens, of which I have two or three, and with which I carefully compared them.

The conclusion which I draw from all these facts is this: there should now be an ample collection of specimens from all the known localities and a careful comparison made of them with those in the eastern herbaria. As suggested in Mrs. Slosson's article, the time of flowering given by Gray—" June and July "—is much too early. Hence, no doubt, the repeated failures of botanists to re-discover the plant in Echo Lake and elsewhere. Probably late in August or early in September the plant may be fonnd in better condition and larger numbers. In the Muskoka specimens I found only one in which the valves of the silicle were shed.

BUFFALO, Sep. 23d, 1889.

The Wave Growth of Corydalis sempervirens.*

One of the most interesting of the new facts observed by me on the trip to the Muskoka Lakes was what I may term a recoil in the wave growth in *Corydalis sempervirens*† which I believe is so far without a parallel. I remarked a few days ago before the Association, that growth in plants was not by slow and regular modification, but in rhythms or waves, and that it was the varying intensity of these waves that largely influenced those variations that gave character to genera and species. So far as I have gone, I have noticed but a flow and a reflex action. In *Compositæ*, for instance, the flower buds were formed at the base of the branchlets of the panicle, and which after reaching a certain size, slept as it were until the terminal bud was formed, and then the advance wave flowed downwards, awakening the flower to renewed growth and perfect bloom. This was especially observable in *Liatris*. In this *Corydalis* there was a similar formation and sleeping of the buds, till the apical bud was reached, which kept on without resting till fully formed and the seed vessel went on the road to maturity. Instead, however, of the next in order downward being started into a renewed growth, as in *Compositæ*, it was the lower on the five-flowered raceme that started the second growth wave, when the other three upwards, successively followed. The relative length of the immature seed vessels showed that the apical flower, or No. 5, opened first, which was followed by the lowest as No. 1, then No. 2, 3, and 4.

In the Fig. 179, Botanical Magazine, this arrangement is faithfully given by the artist, though it has been left to our time to note it, and to discover its significance.

THOMAS MEEHAN.

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*Read before the Botanical Club, A. A. A. S., at the Toronto Meeting, September 1, 1889.

† *C. sempervirens* (L. 1753), Pers. 1806 ; *C. glauca*, Pursh, 1814.